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A NOTE ON THE SPECIALIZATION OF MENTAL FUNCTIONS WITH VARYING CONTENT

SINCE Spearman¹ showed the inadequacy of correlations calculated from original measures subject to chance variations, revisions of all previous results, such as those of Wissler² and Thorndike,³ have been needed to decide how far the extraordinary specialization of mental functions to which the earlier researches bore witness holds true when the reducing influence of chance variations in the original measures upon these intercorrelations has been removed or allowed for.

I have recently made such a revision in the case of the relation between (1) accuracy in drawing a line to equal a 100 mm. line and (2) accuracy in drawing a line to equal a 50 mm. line. Wissler, using a single trial with a 50 mm. line and its bisection, found a correlation (Pearson coefficient) of only $+.38$. My records comprise 30 trials for each length with 37 individuals, young women from 19 to 23 years old, all in the same class in the New York City Training School and so all of very closely the same degree of mental maturity. I use the deviation from the standard as the measure of inaccuracy. I obtain as the probable true correlation $+.77$. The obtained correlations from which the $+.77$ is estimated by the Spearman formulæ are (Pearson coefficients):

Av. Error of 1st 15 100 mm. lines with	Av. Error of 1st 15 50 mm. lines	+	.655
“ 1st “ “ “	“ 2d “ “	“	+.533
“ 2d “ “ “	“ 1st “ “	“	+.432
“ 2d “ “ “	“ 2d “ “	“	+.471
“ 1st “ “ “	“ 2d 15 100 mm. “	“	+.642
“ 1st 15 50 mm. “ “	“ 2d “ 50 “ “	“	+.642
Average Error of 30 100 mm. lines with	Average Error of 30 50 mm. lines	+	.582

The importance of this result lies in the failure, even after correction of perfect correlation between the function of equaling a 100 mm. line and that of equaling a 50 mm. line. The resemblance denoted by $r = .77$ is not very close. For instance, we may say that a man's ability to equal 100 mm. lines is little or no more like his own ability to equal 50 mm. lines than it is like his twin brother's ability to equal 100 mm. lines. Such a state of affairs seems preposterous. But the fact remains and, until more elaborate measures are made, it must apparently be accepted. Nor is it without corroboration. Woodworth and Thorndike⁴ found that training in estimating short lines ($\frac{1}{2}$ to $1\frac{1}{2}$ inches) did not spread at all readily to estimating

¹ *American Journal of Psychology*, 1904.

² Monograph Supplement No. 16 to the *Psychological Review*, 1901.

³ “Heredity, Correlation and Sex Differences,” 1903.

⁴ *Psychological Review*, July, 1901.

long lines (6–24 inches). Recent studies of the behavior of the eye give the possibility that the physiological events may be more different in the two cases than has been supposed.

But if accuracy of discrimination of length means something radically different when the length is 50 mm. from what it means when the length is 100 mm., does it not appear that our descriptive names for mental functions are very inadequate? If the variations with content of the processes to which we give the same name are so great as this sample case would make them out, should not the psychologist make content a matter of prime importance for study? The case just quoted shows content as far more influential than it has been supposed to be, but I could also quote cases where it is less influential than it has been supposed to be. Our traditional psychology has been unable to deduce even very simple relations,⁵ and this inability implies that it does not know what the functions are which it names and pretends to describe.

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DISCUSSION

CONCERNING A PHILOSOPHICAL PLATFORM: A REPLY TO PROFESSOR CREIGHTON

EVERY rational discussion rests necessarily on the assumption that an agreement on the points under inquiry is both desirable and possible. This assumption every worker in any department of knowledge tacitly makes, except the radical sceptic alone. His position may be unassailable, but it is so merely because he places himself outside of any generating problem whatsoever. His thesis remains therefore an absolutely barren speculative possibility. In order formally to exclude him, we could state our own problem in the hypothetical form: Assuming an agreement on some philosophical questions and their answers to be both desirable and possible, required to find them and to devise methods by which agreement on them can be obtained. The critic who wishes to assail this assumption may try with the opposite hypothesis.

⁵ For instance, who of my readers will, in ignorance of direct experimental data, venture to estimate the coefficients of correlation between:

1. Ability in addition and ability in writing the opposites of words.
2. Ability in addition and ability in marking A's on a sheet of capitals.
3. Ability in addition and ability in doing arithmetical "problems."
4. Ability in division and ability in doing arithmetical problems.
5. Ability in drawing lines to equal a 100 mm. line and ability in judging which of two lines both about 100 mm. long is greater.